

REMARKS

In an Office Action mailed October 2, 2002, Claims 1-12 and 26-36 of the parent application were rejected under 35 U.S.C. §102(b) based on Stothers et al. (US Patent No. 5,768,124)(“the Stothers patent”). In addition, in this Office Action, the specification and Claims 2, 26, and 33 were determined to be objectionable due to various informalities.

In order to obtain allowance of Claims 13-25 and 37-55 of the parent application, Claims 1-12 and 26-36 were cancelled. These claims are now presented again for examination in this application as new Claims 1-23. The rejection and informalities cited against these Claims in the parent application are addressed separately below.

1. Informalities

It is submitted that the specification and claims of the subject application comply with the informalities noted on pages 2-3, items 1-9 of the Office Action mailed October 2, 2002. These modifications to the specification and claims were made to correct minor misspellings and typos. It is therefore submitted that such modifications were not made for any reason related to patentability of the claimed invention.

2. Claim Rejections Under 35 U.S.C. §102(b)

In the parent application, the Office Action mailed October 2, 2002 rejected Claims 1-23, as now numbered in the present application, under 35 U.S.C. §102(b) based on the Stothers patent. The Office Action states that the Stothers patent’s “undesired signal” or “reference signal” (“ $x(n)$ ” in Figs. 1-3, 6, and 7 and related description of the Stothers patent) corresponds to the “hedge signal” generated in Claim 1 of the present application. The Stothers patent indicates that the signal $x(n)$ can be engine noise to which its control systems adapt in order to cancel the noise. The adaptive control systems of the Stothers patent necessarily adapt to the signal $x(n)$ in order to accomplish this objective.

In contrast, Claim 1 recites “generating a hedge signal to avoid adaptation to at least one characteristic of an adaptive control system and/or a plant controlled by the adaptive control system.” Thus, the purpose of the “hedge signal” is the opposite to that of the reference signal $x(n)$ of the Stothers patent: it prevents adaptation of the control system to a characteristic of the adaptive control system and/or plant to which the adaptive control system is not to adapt. Thus,

adaptation to a characteristic resulting from exceeding the control or rate limits of a controller or actuator, time delay required for a control action to generate a plant response, and/or time delay required for a control action to generate a plant response, for example, can be avoided through generation of the hedge signal. Thus, the Stothers patent fails to disclose any generation of a hedge signal as defined in the claimed invention. Accordingly, it is submitted that Claim 1 is patentable over the prior art.

Claims 2-12 depend from Claim 1 and include all of the limitations of that Claim plus additional limitations that are not disclosed by the prior art. For example, Claim 2 recites the additional steps “modifying a commanded state signal with the hedge signal” and “generating a reference model state signal based on the commanded state signal modified with the hedge signal...” In the Stothers patent, the reference signal $x(n)$ is, more or less, the commanded state signal recited in Claim 2. This fact further emphasizes that the Stothers patent fails to disclose any signal comparable to the hedge signal of the claimed invention (note that the Stothers patent has no element receiving the signal $x(n)$ and generating another signal supplied to path A). The Stothers patent thus fails to disclose the steps recited in Claim 2. Claim 4 recites that the “hedge signal is generated in the step (a) based on a difference between a first signal derived from a plant model not having the characteristic, and a second signal derived from a plant model having the characteristic.” The Stothers patent does not disclose generation of any signal based on a plant model not having a characteristic and plant model having a characteristic. In addition, Claim 12 states that the plant is “an unmanned vehicle.” The Stothers patent fails to disclose these features of the claimed invention. Thus, for these reasons as well as those stated above with respect to Claim 1, dependent Claims 2-12 patentably distinguish over the prior art.

Claim 13 recites:

In an adaptive control system for controlling a plant, a hedge unit coupled to receive at least one control signal and a plant state signal, the hedge unit generating a hedge signal based on the control signal, the plant state signal, and a hedge model including a first model having a characteristic to which the adaptive control system is not to adapt, and a second model not having the characteristic to which the adaptive control system is not to adapt, the hedge signal used in the adaptive control system to remove the characteristic from a signal supplied to an adaptation law unit of

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the adaptive control system so that the adaptive control system does not adapt to the characteristic in controlling the plant.

The Stothers patent fails to disclose an adaptive control system that includes a hedge unit as recited in Claim 13. More specifically, the Stothers patent fails to disclose a hedge unit that generates a hedge signal based on a control signal, plant state signal, and a hedge model with a first model having the characteristic to which the adaptive control system is not to adapt, and a second model not having the characteristic to which the adaptive control system is not to adapt. Thus, Claim 13 fails to disclose the claimed invention.

Claims 14-23 depend, directly or indirectly, from Claim 13 as amended and include all of the limitations of that claim plus additional limitations that are not disclosed by the prior art. For example, Claims 14-20 each recite that the characteristic to which the control system is not to adapt is a time delay or control limit. No such characteristics are addressed in the Stothers patent. Moreover, Claim 36 recites that "the plant is an unmanned vehicle." This is not disclosed in the Stothers patent. Thus, for these reasons as well as for the reasons stated above with respect to Claim 13, it is submitted that Claims 14-23 are patentable over the prior art.

CONCLUSION

It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Applicant submits that the claims are not taught or suggested by any of the references cited by the Examiner and respectfully requests that the rejections be withdrawn. The above is submitted as being fully responsive to the Office Action mailed October 2, 2002 in the parent application. The Applicant believes that Claims 1-23 are now in a condition of allowance, and respectfully requests allowance of all claims. Should there be any questions or if the Examiner

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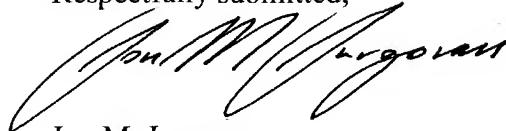
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does not believe the claims are in a condition for allowance, the Examiner is requested to contact Applicant's attorney at (404) 881-4583.

Respectfully submitted,



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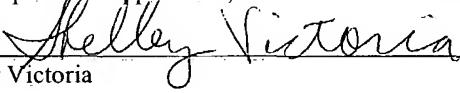
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